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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/571,288

03/09/2006

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22428 7590 02/13/2008
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EXAMINER

D'ANIELLO, NICHOLAS P

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

02/13/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/571,288	Applicant(s) HEEB ET AL.	
	Examiner Nicholas P. D'Aniello	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/9/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 5, 7 and 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 is rejected because it refers to

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an oxide (or hydroxide) layer that consists predominantly of boehmite, where boehmite is not an oxide. Claim 5 refers to "the homogeneities" where no prior antecedent basis for homogeneities is found in claim 1, for the purpose of examination this claim is taken to be referring to the homogeneities in claim 4. Similarly, claim 7 refers to "the lubricant" where no prior antecedent basis for a lubricant is found in claim 1, for the purpose of examination this claim is taken to be referring to the lubricant in claim 6. Claims 12-15 refer to the process as claimed in claim 1, where claim 1 is directed to a work piece. For the purpose of examination these claims are assumed to be directed towards the soldering process of claim 10.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori (US Patent No. 5,300,209).

Mori teaches an aluminum based-system alloy where an **aluminum** oxide layer (solder layer) has been formed by anodizing which has a thickness of 300 nm (column 6, lines 51-58) which is thicker than the original native oxide layer. This work piece is intended to be part of a multilayer wiring board and is therefore reasonably expected to perform as a **soldering** work piece.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US Patent No. 5,300,209) as applied to claim 1 above, and further in view of McMillan et al. (US Patent No. 3,986,897).

Mori teaches a soldering work piece with an oxide layer thicker than the native oxide layer as applied to claim 1. Claim 2 differs from the reference in calling for the oxide/hydroxide layer to be predominantly boehmite. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the aluminum oxide layer in a hydrated boehmite form motivated by the fact that McMillan et al., also drawn to passivated aluminum substrates, discloses the treatment of aluminum by converting aluminum oxide to boehmite in order to achieve an aluminum substrate with a smoother less hillocked surface which also avoids pitting, electro-migration and has improved thermal properties (column 1, lines 43-50 and column 2, lines 52-62).

Claims 4 and 5 differ from the reference in calling for the oxide layer to include inhomogeneities formed by chemical, thermal or mechanical treatment. However, it would have been obvious in the art that cracks (pitting) and in-homogeneities (hillocks) in the oxide coating would form as a result of heating (thermal treatment) because

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McMillan et al. teach that hillocking and pitting are problems with the aluminum oxide coating on substrates (column 1, lines 43-50).

8. Claim 6, 7 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US Patent No. 5,300,209) as applied to claim 1 above, and further in view of Swaney (US Patent No. 3,747,199).

Mori teaches a soldering work piece with an oxide layer thicker than the native oxide layer as applied to claim 1. Claims 6 and 7 differ from the reference in calling for a particular lubricant. However, it would have been obvious in the art to provide the soldering work piece with a lubricant because Swaney teaches a method of brazing aluminum articles which have been provided with a petroleum based lubricant, Cindol 3401, which is reasonably expected to contain bromide (halogen) and sulfur compounds (column 2, lines 23-27).

In regard to claim 10, it would have been obvious in the art that two work pieces with at least with an oxide layer thicker than the native oxide layer could be joined because (A) Mori et al. teach anodizing aluminum to have a thicker oxide layer and (B) Swaney teaches a method of vacuum brazing aluminum articles.

In regard to claims 11 and 12, it would have been obvious to apply a lubricant as applied to claims 6 and 7 above.

In regard to claim 13, it would have been obvious in the art that the thermal degreasing and soldering would be carried out together because Swaney teaches a single heating operation where the lubricants are volatilized (evaporated, thermal

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degreasing) and then the temperature is increased to effectuate the braze (column 2, lines 28-47).

In regard to claim 14, it would have been obvious in the art to employ a shielding gas because (A) Swaney teaches vacuum brazing (column 1, lines 58-62) and (B) inert (shielding) gasses and vacuum processing are art recognized alternatives.

In regard to claim 15, it would have been obvious in the art that to make a heat exchanger out of such a work piece because Swaney teaches an example of his invention is for the fabrication of a typical aluminum brazed heat exchanger (column 1, lines 36-44).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US Patent No. 5,300,209).

Mori teaches a soldering work piece with an oxide layer thicker than the native oxide layer as applied to claim 1. Claim 9 differs from the reference in calling for magnesium in the content between 0.5 and 2.0 wt %. However, it would have been obvious in the art to include magnesium because magnesium is a common alloying agent in aluminum such as the entire 5000 series of aluminum alloys which contain magnesium. The low magnesium alloys (.5 to 1.5 wt%) having the best formability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas P. D'Aniello whose telephone number is

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(571)270-3635. The examiner can normally be reached on Monday through Thursday from 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NPD

2/11/2008

/Jerry A Lorengo/

Supervisory Patent Examiner, Art Unit 1793